Amendments to the Claims:

Please amend the claims as presented below in the Listing of Claims. This Listing of Claims will replace all prior versions and listings of claims in this application.

Listing of Claims:

1 - 34. (Cancelled)

35. (Currently Amended) A method of transmitting data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

coding and modulating a first plurality of data streams to obtain a first plurality of data symbol streams;

spatially processing the first plurality of data symbol streams with a first plurality of steering vectors to obtain a first plurality of transmit symbol streams for transmission from a plurality of antennas to a first user terminal in a first transmission interval;

coding and modulating a second plurality of data streams to obtain a second plurality of data symbol streams; and

providing the second plurality of data symbol streams as a second plurality of transmit symbol streams in accordance to a non-steered spatial multiplexing mode for transmission from the plurality of antennas to a second user terminal in a second transmission interval.

36. (Original) The method of claim 35, further comprising:

deriving the first plurality of steering vectors such that the first plurality of data streams are transmitted on a plurality of orthogonal spatial channels of a first MIMO channel for the first user terminal.

37. (Original) The method of claim 35, further comprising:

coding and modulating a third plurality of data streams to obtain a third plurality of data symbol streams; and

spatially processing the third plurality of data symbol streams with a second plurality of

steering vectors to obtain a third plurality of transmit symbol streams for transmission from the plurality of antennas to a plurality of user terminals in a third transmission interval.

38. (Original) The method of claim 37, further comprising:

deriving the second plurality of steering vectors such that the third plurality of data streams are received with suppressed crosstalk at the plurality of user terminals.

39. (Currently Amended) An apparatus in a wireless multiple-input multiple-output (MIMO) system, comprising:

a transmit data processor operative to

code and modulate a first plurality of data streams to obtain a first plurality of data symbol streams, and

code and modulate a second plurality of data streams to obtain a second plurality of data symbol streams; and

a transmit spatial processor operative to

spatially process the first plurality of data symbol streams with a first plurality of steering vectors to obtain a first plurality of transmit symbol streams for transmission from a plurality of antennas to a first user terminal in a first transmission interval, and

provide the second plurality of data symbol streams as a second plurality of transmit symbol streams <u>in accordance to a non-steered spatial multiplexing mode</u> for transmission from the plurality of antennas to a second user terminal in a second transmission interval.

40. (Currently Amended) A method of receiving data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

performing receiver spatial processing on a first plurality of received symbol streams in accordance with a first spatial multiplexing mode to obtain a first plurality of recovered data symbol streams;

demodulating and decoding the first plurality of recovered data symbol streams in accordance with a first plurality of rates to obtain a first plurality of decoded data streams;

performing receiver spatial processing on a second plurality of received symbol streams in accordance with a second spatial multiplexing mode to obtain a second plurality of recovered

data symbol streams, wherein the second spatial multiplexing mode is a non-steered spatial multiplexing mode; and

demodulating and decoding the second plurality of recovered data symbol streams in accordance with a second plurality of rates to obtain a second plurality of decoded data streams.

41. (Original) The method of claim 40, wherein the first spatial multiplexing mode is a steered spatial multiplexing mode, and wherein the first plurality of received symbol streams are spatially processed with a plurality of eigenvectors for a plurality of spatial channels of a MIMO channel for a user terminal.

42. (Cancelled) The method of claim 40, wherein the second spatial multiplexing mode is a non-steered spatial multiplexing mode.

43. (Original) The method of claim 42, wherein the second plurality of decoded data streams are estimates of a plurality of data streams transmitted by a single user terminal.

44. (Original) The method of claim 42, wherein the second plurality of decoded data streams are estimates of a plurality of data streams transmitted simultaneously by a plurality of user terminals.

45. (Original) The method of claim 42, wherein the second plurality of received symbol streams are spatially processed based on a channel correlation matrix inversion (CCMI) technique.

46. (Original) The method of claim 42, wherein the second plurality of received symbol streams are spatially processed based on a minimum mean square error (MMSE) technique.

47. (Original) The method of claim 42, wherein the second plurality of received symbol streams are spatially processed based on a successive interference cancellation (SIC) technique.

48. (Currently Amended) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

a receive spatial processor operative to

perform receiver spatial processing on a first plurality of received symbol streams in accordance with a first spatial multiplexing mode to obtain a first plurality of recovered data symbol streams, and

perform receiver spatial processing on a second plurality of received symbol streams in accordance with a second spatial multiplexing mode to obtain a second plurality of recovered data symbol streams, wherein the second spatial multiplexing mode is a non-steered spatial multiplexing mode; and

a receive data processor operative to

demodulate and decode the first plurality of recovered data symbol streams in accordance with a first plurality of rates to obtain a first plurality of decoded data streams, and

demodulate and decode the second plurality of recovered data symbol streams in accordance with a second plurality of rates to obtain a second plurality of decoded data streams.

49. (Currently Amended) A method of transmitting data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

receiving information indicating a spatial multiplexing mode and a plurality of rates to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode, and wherein each of the plurality of rates is selected from among a set of rates supported by the system;

coding and modulating a plurality of data streams in accordance with the plurality of rates to obtain a plurality of data symbol streams; and

spatially processing the plurality of data symbol streams in accordance with the spatial multiplexing mode to obtain a plurality of transmit symbol streams for transmission from a plurality of antennas.

50. (Original) The method of claim 49, wherein the spatial multiplexing mode is a steered spatial multiplexing mode, and wherein the plurality of data symbol streams are spatially

processed with a plurality of steering vectors to transmit the plurality of data symbol streams on a plurality of orthogonal spatial channels of a MIMO channel.

51. (Original) The method of claim 50, further comprising:

transmitting a steered pilot on each of the plurality of orthogonal spatial channels.

52. (Currently Amended) The method of claim 49, ~~wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode, and~~ wherein the plurality of data symbol streams are provided as the plurality of transmit symbol streams.

[[52]]53. (Original) The method of claim 49, further comprising:

performing calibration so that uplink channel response is reciprocal of downlink channel response.

54. (Currently Amended) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

a controller operative to receive information indicating a spatial multiplexing mode and a plurality of rates to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, wherein at least one of the spatial multiplexing modes is a non-steered spatial multiplexing mode, and wherein each of the plurality of rates is selected from among a set of rates supported by the system;

a transmit data processor operative to code and modulate a plurality of data streams in accordance with the plurality of rates to obtain a plurality of data symbol streams; and

a transmit spatial processor operative to spatially process the plurality of data symbol streams in accordance with the spatial multiplexing mode to obtain a plurality of transmit symbol streams for transmission from a plurality of antennas.

55. (Currently Amended) A method of receiving data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

receiving information indicating a spatial multiplexing mode and at least one rate to use

for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, and wherein each of the at least one rate is selected from among a set of rates supported by the system;

spatially processing at least one received symbol stream in accordance with the spatial multiplexing mode to obtain at least one recovered data symbol stream, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode; and

demodulating and decoding the at least one recovered data symbol stream in accordance with the at least one rate to obtain at least one decoded data stream.

56. (Original) The method of claim 55, wherein the spatial multiplexing mode is a steered spatial multiplexing mode, and wherein a plurality of received symbol streams are spatially processed with a plurality of eigenvectors for a plurality of spatial channels of a MIMO channel to obtain a plurality of recovered data symbol streams.

57. (Cancelled) The method of claim 55, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode.

58. (Original) The method of claim 57, wherein a plurality of received symbol streams are spatially processed based on a channel correlation matrix inversion (CCMI) technique, a minimum mean square error (MMSE) technique, or a successive interference cancellation (SIC) technique to obtain a plurality of recovered data symbol streams.

59. (Original) The method of claim 57, wherein one received symbol stream is processed with channel gain estimates to obtain one recovered data symbol stream.

60. (Currently Amended) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

a controller operative to receive information indicating a spatial multiplexing mode and at least one rate to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, wherein at least one of

the spatial multiplexing modes is a non-steered spatial multiplexing mode, and wherein each of the at least one rate is selected from among a set of rates supported by the system;

a receive spatial processor operative to spatially process at least one received symbol stream in accordance with the spatial multiplexing mode to obtain at least one recovered data symbol stream; and

a receive data processor operative to demodulate and decode the at least one recovered data symbol stream in accordance with the at least one rate to obtain at least one decoded data stream.

61. (Currently Amended) An apparatus of transmitting data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for coding and modulating a first plurality of data streams to obtain a first plurality of data symbol streams;

means for spatially processing the first plurality of data symbol streams with a first plurality of steering vectors to obtain a first plurality of transmit symbol streams for transmission from a plurality of antennas to a first user terminal in a first transmission interval;

means for coding and modulating a second plurality of data streams to obtain a second plurality of data symbol streams; and

means for providing the second plurality of data symbol streams as a second plurality of transmit symbol streams in accordance to a non-steered spatial multiplexing mode for transmission from the plurality of antennas to a second user terminal in a second transmission interval.

62. (Previously Presented) The apparatus of claim 61, further comprising:

means for deriving the first plurality of steering vectors such that the first plurality of data streams are transmitted on a plurality of orthogonal spatial channels of a first MIMO channel for the first user terminal.

63. (Previously Presented) The apparatus of claim 61, further comprising:

means for coding and modulating a third plurality of data streams to obtain a third plurality of data symbol streams; and

means for spatially processing the third plurality of data symbol streams with a second plurality of steering vectors to obtain a third plurality of transmit symbol streams for transmission from the plurality of antennas to a plurality of user terminals in a third transmission interval.

64. (Currently Amended) A computer-program product for transmitting data in a wireless multiple-input multiple-output (MIMO) communication system comprising a computer readable medium having a set of instructions stored thereon, the set of instructions being executable by one or more processors and the set of instructions comprising:

instructions for coding and modulating a first plurality of data streams to obtain a first plurality of data symbol streams;

instructions for spatially processing the first plurality of data symbol streams with a first plurality of steering vectors to obtain a first plurality of transmit symbol streams for transmission from a plurality of antennas to a first user terminal in a first transmission interval;

instructions for coding and modulating a second plurality of data streams to obtain a second plurality of data symbol streams; and

instructions for providing the second plurality of data symbol streams as a second plurality of transmit symbol streams in accordance to a non-steered spatial multiplexing mode for transmission from the plurality of antennas to a second user terminal in a second transmission interval.

65. (Previously Presented) The computer-program product of claim 64, further comprising:

instructions for deriving the first plurality of steering vectors such that the first plurality of data streams are transmitted on a plurality of orthogonal spatial channels of a first MIMO channel for the first user terminal.

66. (Previously Presented) The computer-program product of claim 64, further comprising:

instructions for coding and modulating a third plurality of data streams to obtain a third plurality of data symbol streams; and

instructions for spatially processing the third plurality of data symbol streams with a second plurality of steering vectors to obtain a third plurality of transmit symbol streams for

transmission from the plurality of antennas to a plurality of user terminals in a third transmission interval.

67. (Currently Amended) An apparatus of receiving data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for performing receiver spatial processing on a first plurality of received symbol streams in accordance with a first spatial multiplexing mode to obtain a first plurality of recovered data symbol streams;

means for demodulating and decoding the first plurality of recovered data symbol streams in accordance with a first plurality of rates to obtain a first plurality of decoded data streams;

means for performing receiver spatial processing on a second plurality of received symbol streams in accordance with a second spatial multiplexing mode to obtain a second plurality of recovered data symbol streams, wherein the second spatial multiplexing mode is a non-steered spatial multiplexing mode; and

means for demodulating and decoding the second plurality of recovered data symbol streams in accordance with a second plurality of rates to obtain a second plurality of decoded data streams.

68. (Previously Presented) The apparatus of claim 67, wherein the first spatial multiplexing mode is a steered spatial multiplexing mode, and wherein the first plurality of received symbol streams are spatially processed with a plurality of eigenvectors for a plurality of spatial channels of a MIMO channel for a user terminal.

69. (Cancelled) The apparatus of claim 67, wherein the second spatial multiplexing mode is a non-steered spatial multiplexing mode.

70. (Currently Amended) A computer-program product for receiving data in a wireless multiple-input multiple-output (MIMO) communication system comprising a computer readable medium having a set of instructions stored thereon, the set of instructions being executable by one or more processors and the set of instructions comprising:

instructions for performing receiver spatial processing on a first plurality of received

symbol streams in accordance with a first spatial multiplexing mode to obtain a first plurality of recovered data symbol streams;

instructions for demodulating and decoding the first plurality of recovered data symbol streams in accordance with a first plurality of rates to obtain a first plurality of decoded data streams;

instructions for performing receiver spatial processing on a second plurality of received symbol streams in accordance with a second spatial multiplexing mode to obtain a second plurality of recovered data symbol streams, wherein the second spatial multiplexing mode is a non-steered spatial multiplexing mode; and

instructions for demodulating and decoding the second plurality of recovered data symbol streams in accordance with a second plurality of rates to obtain a second plurality of decoded data streams.

71. (Previously Presented) The computer-program product of claim 70, wherein the first spatial multiplexing mode is a steered spatial multiplexing mode, and wherein the first plurality of received symbol streams are spatially processed with a plurality of eigenvectors for a plurality of spatial channels of a MIMO channel for a user terminal.

72. (Cancelled) The computer-program product of claim 70, wherein the second spatial multiplexing mode is a non-steered spatial multiplexing mode.

73. (Currently Amended) An apparatus of transmitting data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for receiving information indicating a spatial multiplexing mode and a plurality of rates to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, and wherein each of the plurality of rates is selected from among a set of rates supported by the system;

means for coding and modulating a plurality of data streams in accordance with the plurality of rates to obtain a plurality of data symbol streams; and

means for spatially processing the plurality of data symbol streams in accordance with the spatial multiplexing mode to obtain a plurality of transmit symbol streams for transmission

from a plurality of antennas, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode.

74. (Previously Presented) The apparatus of claim 73, wherein the spatial multiplexing mode is a steered spatial multiplexing mode, and wherein the plurality of data symbol streams are spatially processed with a plurality of steering vectors to transmit the plurality of data symbol streams on a plurality of orthogonal spatial channels of a MIMO channel.

75. (Currently Amended) The apparatus of claim 73, ~~wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode, and~~ wherein the plurality of data symbol streams are provided as the plurality of transmit symbol streams.

76. (Previously Presented) The apparatus of claim 73, further comprising:

means for performing calibration so that uplink channel response is reciprocal of downlink channel response.

77. (Currently Amended) A computer-program product for transmitting data in a wireless multiple-input multiple-output (MIMO) communication system comprising a computer readable medium having a set of instructions stored thereon, the set of instructions being executable by one or more processors and the set of instructions comprising:

instructions for receiving information indicating a spatial multiplexing mode and a plurality of rates to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, and wherein each of the plurality of rates is selected from among a set of rates supported by the system;

instructions for coding and modulating a plurality of data streams in accordance with the plurality of rates to obtain a plurality of data symbol streams; and

instructions for spatially processing the plurality of data symbol streams in accordance with the spatial multiplexing mode to obtain a plurality of transmit symbol streams for transmission from a plurality of antennas, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode.

78. (Previously Presented) The computer-program product of claim 77, wherein the spatial multiplexing mode is a steered spatial multiplexing mode, and wherein the plurality of data symbol streams are spatially processed with a plurality of steering vectors to transmit the plurality of data symbol streams on a plurality of orthogonal spatial channels of a MIMO channel.

79. (Currently Amended) The computer-program product of claim 77, ~~wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode, and~~ wherein the plurality of data symbol streams are provided as the plurality of transmit symbol streams.

80. (Previously Presented) The computer-program product of claim 77, further comprising:

instructions for performing calibration so that uplink channel response is reciprocal of downlink channel response.

81. (Currently Amended) An apparatus of receiving data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for receiving information indicating a spatial multiplexing mode and at least one rate to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, and wherein each of the at least one rate is selected from among a set of rates supported by the system;

means for spatially processing at least one received symbol stream in accordance with the spatial multiplexing mode to obtain at least one recovered data symbol stream, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode; and

means for demodulating and decoding the at least one recovered data symbol stream in accordance with the at least one rate to obtain at least one decoded data stream.

82. (Previously Presented) The apparatus of claim 81, wherein the spatial multiplexing mode is a steered spatial multiplexing mode, and wherein a plurality of received symbol streams are spatially processed with a plurality of eigenvectors for a plurality of spatial channels of a MIMO channel to obtain a plurality of recovered data symbol streams.

83. (Cancelled) The apparatus of claim 81, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode.

84. (Currently Amended) A computer-program product for receiving data in a wireless multiple-input multiple-output (MIMO) communication system comprising a computer readable medium having a set of instructions stored thereon, the set of instructions being executable by one or more processors and the set of instructions comprising:

instructions for receiving information indicating a spatial multiplexing mode and at least one rate to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, and wherein each of the at least one rate is selected from among a set of rates supported by the system;

instructions for spatially processing at least one received symbol stream in accordance with the spatial multiplexing mode to obtain at least one recovered data symbol stream, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode; and

instructions for demodulating and decoding the at least one recovered data symbol stream in accordance with the at least one rate to obtain at least one decoded data stream.

85. (Previously Presented) The computer-program product of claim 84, wherein the spatial multiplexing mode is a steered spatial multiplexing mode, and wherein a plurality of received symbol streams are spatially processed with a plurality of eigenvectors for a plurality of spatial channels of a MIMO channel to obtain a plurality of recovered data symbol streams.

86. (Cancelled) The computer-program product of claim 84, wherein the spatial multiplexing mode is a non-steered spatial multiplexing mode.